on the other hand, incomplete ovulate flowers, which are very small and always concealed by the staminate flowers, occur in the staminate inflorescence. It is suggested, therefore, that *G. scandens* represents a reduction stage of ovulate flowers in an inflorescence which is becoming staminate, a pure staminate inflorescence being reached in *G. africanum* and *G. Buchholzianum*. Naturally this situation suggests that the present monosporangiate inflorescence of *Gnetum* has been derived from a bisporangiate inflorescence. It is suggested further that the ovulate inflorescence was probably derived "by the arrest of the nodal meristem by which the later formed staminate flowers are produced." Since a terminal ovulate flower is of common occurrence, such a flower replacing the barren tip of the axis, it is suggested that the primitive inflorescence consisted of "an axis bearing a cupule, a ring of male flowers, and a terminal female flower or a group of which one is terminal," which is certainly suggestive of the strobilus of the Bennettitales. Further evidence is presented to indicate that the staminate flower, commonly thought of as a reduced staminate strobilus ("anthostrobilus"), probably has no such relationship.—J. M. C.

Plant pathology in the tropics.—Those who have followed this branch of botany must be impressed by the large amount of work accomplished in the past five years. In an interesting paper by ASHBY[17] we find a discussion of (1) bud diseases of the coconut, in which the author expresses the opinion that the bud rot attributed by JOHNSON (U.S. Bur. Pl. Ind. Bull. 228) to *Bacillus coli* may be due also to other species of bacteria; other species found associated with the bud rot were connected to the type groups *B. carotovous*, *B. aerogenes*, and *B. typhi;* (2) a bud decay of the coconut caused by *Thielaviopsis paradoxa*, which is also the cause of diseases of bananas, sugar cane, pineapple, and stem of the coconut; (3) another bud decay apparently caused by a species of *Phytophthora;* (4) several leaf diseases due to *Diplodia epicocos* Cooke, *Pestalozzia palmarum* Cooke, and other fungi; (5) several other fungous diseases of the root and stem of the coconut; (6) diseases of the cocoa; (7) diseases of the banana; (8) diseases of the orange. The author gives good descriptions of the diseases and of the organisms.

The Department of Agriculture of Jamaica has issued a bulletin on "Diseases of plants," in which are given laws in regard to the introduction and spread of plant diseases, and orders concerning the "Panama disease" or "wilt" of the banana. This is followed by a description of the disease which causes a breaking down of the leaves, with or without previous yellowing, beginning with the oldest. The trunk is sometimes split and the fruit ripens prematurely and is dry, pithy, and without flavor. Internally will be found many dark red streaks extending from the base upward through stems and leaves. This condition is followed by a stinking soft rot. The disease is attributed to a *Fusarium*, very similar in morphology and habit to *F. vasinfectum* Atk. It is

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[17] ASHBY, S. F., Notes on diseases of cultivated crops observed in 1913–1914. Bull. 8, Dept. Agric. 2:299–327. 1915.

a soil organism which gains entrance through wounds and readily passes from the parent plant to the suckers. It spreads by diseased plants, infected soils, by farm implements, and on the clothing and boots of the laborers.—MEL. T. COOK.

Permeability.—STILES and JORGENSEN[18] have measured the effect of temperature on the rate at which hydrogen ions of hydrochloric acid are absorbed by the tissue of potato tuber. Disks of potato tubers 1 cm. in diameter, weighing about 0.5 gm., were immersed in HCl of concentration 0.0011 N. This low concentration was used in order to avoid injury to the tissue. Experiments were carried out at temperatures of 0° C., 10° C., 20° C., and 30° C. At intervals up to 8 hours the quantity of the hydrogen ions absorbed was measured by determining the loss of hydrogen ions in the bathing solution. The hydrogen ion content of the latter was measured by a hydrogen electrode, a description of which the authors give.

The rate of absorption was increased by a rise of 10° C. as follows: from 0° to 10°, 2.22 times; from 10° to 20°, 2.17 times; from 20° to 30°, 2.18 times. This is in agreement with the Van't Hoff law for the effect of temperature upon the rate of chemical reaction, and the authors conclude that "the study of the effect of temperature on the absorption of the hydrogen ion would seem to indicate that the absorption is controlled by some chemical action in the cell, and is not the result of simple diffusion through the plasma membrane, or of mere absorption by the cell protoplasm." Their view is that the acid reacts with some substance in the potato, that this substance is either present in large quantity as compared with the amount of acid fixed, or that the resulting compound is broken down again almost as soon as formed. As to the identity of the substance that reacts with the acid, they state it is "presumably the plasma membrane, or some part of it." The reviewer is not convinced yet, however, that in their experiments they were dealing primarily with the permeability of the plasma membrane. The title of the paper expresses the situation more exactly.—F. E. DENNY.

The humidity of a ravine.—It has long been commonly accepted that both the atmospheric humidity is greater and the supply of soil moisture more abundant in a narrow ravine than upon the adjacent upland, but no quantitative data have been available to confirm these observations. To supply these deficiencies ULLRICH[19] measured the evaporating power of the air at 15 different points in a clay ravine, and determined the range of soil moisture for a corresponding number of stations for a period of four months, from the beginning

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[18] STILES, WALTER, and JORGENSEN, INGVAR, Studies in permeability. II. The effect of temperature on the permeability of plant cells to the hydrogen ion. Ann. Botany **29**:611–618. *figs. 4.* 1915.

[19] ULLRICH, F. T., The relation of evaporation and soil moisture to plant succession in a ravine. Bull. Ill. State Lab. Nat. Hist. **12**:1–16. *pl. 18.* 1915.